

Changements to EPJC041122

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- Section 2 paragraph 1.** The target used in the present study is a mercury liquid jet \cite{CERN} simulated for a sake of simplicity by a cylinder \$30\text{~cm}\$ long (representing two hadronic lengths) and \$1.5\text{~cm}\$ diameter (see table~\ref{tab:targ}) \cite{JJG}. Other types of target are under study \cite{CERN}. The pencil like simulated proton beam is composed with \$10^6\$ mono-energetic protons, and no beam-target dynamical effects are taken into account. The beam axis is also the symmetry axis of the target and the horns and the decay tunnel. Simulations have been performed for \$2.2\text{~GeV}\$ proton kinetic energy, the up to now nominal design \cite{SPL}, as well as for \$3.5\text{~GeV}\$, \$4.5\text{~GeV}\$, \$6.5\text{~GeV}\$ and \$8\text{~GeV}\$ according to possible new designs \cite{MMWPSGaroby}.
- End of Section 2.** For a \$2.2\text{~GeV}\$ beam and a positive focusing, \$45\%\$ more \$\nu_\mu\$ and \$\nu_e\$ neutrinos are produced around the oscillation probability maximum with the FLUKA generator. In turn out that a sensitivity \$20\%\$ beter for FLUKA compared to MARS has been found for the \$\sin^2(2\theta_{13})\$ sensitivity as it is driven by the number of oscillated neutrino events divided by the squared root of the number of background events mainly induced by \$\nu_e\$ from the beam (see section~\ref{sec:results}), that sensitivity difference can be taken as a systematic error.
- Replacement of figure 4** (KaonProd.ps) by new one (KaonPionProdFluka2003v2.eps) for better clarity.
- Add columns to Tab.5** for better clarity.
- Section 6 paragraph 1.** The sensitivity to \$\theta_{13}\$ and \$\delta_{CP}\$ is computed for a \$\nu_\mu \rightarrow \nu_e\$ appearance experiment. The detector considered for definitiveness is similar to the UNO detector, \textit{i.e.} a \$440\text{~kt}\$ fiducial water \sqrt{C}erenkov detector \cite{UNO}. The detector simulation has been presented in reference \cite{JJG} and the analysis program described in reference \cite{MEZZETTONUFACT060} has been used for sensitivity computation following previous work of reference \cite{Mezzetto}. See table~\ref{tab:param} for the default user parameter values used in this paper. We just remind here some key points of the sensitivity analysis program.
- Significance parameter** translated to quality factor (**formula 1**) and S-factor (**Tab. 7**)

7. Update of Reference [25]

J.J. Gómez Gadenas *et al*, IFIC/01-31, Proceedings of Venice 2001, Neutrino telescopes, vol. 2, p463-481; see also arXiv:hep-ph/0105297; A. Blondel *et al*, *NIM A* **503** 173 (2001); A. Blondel *et al*, CERN-2004-002